

IN THE CLAIMS

Please amend the claims to the following.

1. (Previously Amended) An apparatus comprising:
a processor including:
marking logic to mark instruction information for an instruction of a speculative thread as speculative; and
blocker logic to prevent data associated with a store instruction of the speculative thread from being forwarded to an instruction of a non-speculative thread, the blocker logic further to prevent the data from being stored in a memory system.
2. (Original) The apparatus of claim 1, wherein: blocker logic is further to allow the data associated with a store instruction of the speculative thread to be forwarded to an instruction of a second speculative thread.
3. (Original) The apparatus of claim 1, further comprising: a plurality of store request buffers, each store request buffer including a speculation identifier field.
4. (Original) The apparatus of claim 1, wherein the memory system further comprises: a data cache that includes a safe-store indicator field associated with each entry of a tag array.

1 5. (Cancelled)

1 6. (Original) The apparatus of claim 1, wherein blocker logic further includes:
2 dependence blocker logic to prevent data associated with a speculative store instruction
3 from being forwarded to an instruction of the non-speculative thread ; and
4 store blocker logic to prevent the data from being stored in a memory system.

1 7. (Previously Amended) The apparatus of claim 6, wherein: store blocker logic is outside
2 an execution pipeline.

1 8. (Cancelled)

1 9. (Original) The apparatus of claim 6, wherein: dependence blocker logic is included in an
2 execution pipeline.

1 10. (Previously Amended) The apparatus of claim 9, wherein: dependence blocker logic is
2 included in a memory ordering buffer of the processor.

1 11. (Currently Amended) A system, comprising:
2 a memory system that includes a memory device; and
3 a processor associated with the memory system, the processor including dependence
4 blocker logic to prevent data associated with a store instruction of a speculative
5 thread from being forwarded to an instruction of a non-speculative thread, and to
6 allow the data associated with the store instruction of the speculative thread to be
7 forwarded to a speculative instruction of another speculative thread.

1 12. (Previously Amended) The system of claim 11, wherein: the processor further includes
2 store blocker logic to prevent the data from being stored in the memory system
3 and marking logic to mark instruction information associated with the store
4 instruction as speculative.

1 13. (Original) The system of claim 12, wherein: the marking logic is further to associate a
2 safe speculation domain ID with the instruction information.

1 14. (Original) The system of claim 13, wherein: the marking logic is further to indicate a
2 thread identifier as the speculation domain ID.

1 15. (Original) The system of claim 12, further comprising: a store request buffer to store the
2 speculation domain ID.

1 16. (Original) The system of claim 11, wherein: the processor includes a first logical
2 processor to execute the non-speculative thread; and the processor includes a
3 second logical processor to execute the speculative thread.

1 17. (Original) The system of claim 11, further comprising:
2 a second processor that includes said dependence blocker logic and said store blocker
3 logic;
4 wherein said processor is to execute the non-speculative thread and said second processor
5 is to execute the speculative thread.

1 18. (Previously Amended) The system of claim of claim 11, wherein: the memory system
2 includes store blocker logic to prevent the data from being stored in the memory
3 system and a cache organized to include a plurality of tag lines, wherein each tag
4 line of the cache includes a unique helper thread ID field.

1 19. (Original) The system of claim 11, wherein: the memory system includes a cache
2 organized to include a plurality of tag lines, wherein each tag line of the cache
3 includes a safe-store indicator field.

1 20. (Original) The system of claim 11, wherein: the memory system includes a victim tag
2 cache to indicate evicted cache lines that include speculative load data.

1 21. (Original) A method, comprising:

2 receiving instruction information for a load instruction, the instruction information
3 including a load address;

4 performing a dependence check, wherein performing the dependence check includes:

5 determining if a store address of an in-flight store instruction matches the load
6 address; and

7 determining if the load instruction and the in-flight store instruction each
8 originate with a speculative thread;

9 forwarding, if the dependence check is successful, store data associated with the in-flight
10 store instruction to the load instruction; and

11 declining to forward, if the dependence check is not successful, the store data to the load
12 instruction.

1 22. (Original) The method of claim 21, wherein performing the dependence check further
2 comprises: determining if the in-flight store instruction and the load instruction
3 originate from the same thread.

1 23. (Original) The method of claim 22, wherein determining if the in-flight store instruction
2 and the load instruction originate from the same thread further comprises: determining if a
3 thread ID associated with the in-flight store instruction matches a thread ID associated with
4 the load instruction.

1 24. (Original) The method of claim 21, wherein performing the dependence check further
2 comprises: if the load instruction and the in-flight store instruction do not each
3 originate with a speculative thread, determining if the load instruction and the in-
4 flight store instruction each originate with a non-speculative thread.

1 25. (Original) The method of claim 21, further wherein: declining to forward further
2 comprises declining to forward the store data to the load instruction if (the load
3 instruction and the in-flight store instruction each originate with a speculative
4 thread) AND (the in-flight store instruction originates with a speculative thread
5 that is not older in program order than the speculative thread from which the load
6 instruction originates).

1 26. (Previously Amended) A method, comprising:
2 determining a cache line in a cache corresponding to a speculative thread cache write
3 request includes dirty non-speculative data; and
4 in response to determining the a cache line ~~in a cache~~ corresponding to the a speculative
5 thread cache write request includes dirty non-speculative data;
6 generating a writeback of the dirty non-speculative data; and
7 marking the cache line as speculative.

1 27. (Previously Amended) The method of claim 26, further comprising: forwarding
2 speculative data from a cache to the speculative thread responsive to a speculative thread
3 cache read request.

1 28. (Previously Amended) The method of claim 26, further comprising: forwarding non-
2 speculative store data from a cache to the speculative thread responsive to a speculative
3 thread cache read request.

1 29. (Previously Amended) The method of claim 26, further comprising: forwarding non-
2 speculative data from a cache to a non-speculative thread responsive to a non-speculative
3 thread cache read request.

1 30. (Previously Amended) The method of claim 26, further comprising processing a cache
2 access request from a non-speculative thread, wherein processing a cache access
3 request from a non-speculative thread comprises:

4 if a cache does not include a cache line associated with the cache access request,
5 allocating a new cache line;

6 wherein allocating a new cache line further comprises:

7 if the new cache line includes dirty speculative data, allocating the new cache line
8 without generating a writeback operation; and

9 if the new cache line includes dirty non-speculative data, generating a writeback
10 operation.

1 31. (Previously Amended) The method of claim 26, further comprising: allowing the
2 speculative thread to write data to the cache if the cache line corresponding to the speculative
3 thread cache write request includes speculative data.

1 32. (Cancelled)

1 33. (Previously Amended) The method of claim 26, further comprising:

2 if the cache does not contain data in a cache line corresponding to the speculative thread

3 cache write request:

4 allocating a new cache line;

5 marking the new cache line as speculative; and

6 allowing the speculative thread to write speculative data to the new cache line.

1 34. (Previously Added) An apparatus comprising:

2 a processor including:

3 a first logical processor to execute a speculative thread;

4 a second logical processor to execute a non-speculative thread;

5 a storage area to include a speculation identifier (ID) field, the speculation ID

6 field to hold a first value to indicate an associated store instruction is

7 associated with the speculative thread; and

8 control logic to prevent data associated with the store instruction from being

9 consumed by the non-speculative thread, based on the speculation ID

10 holding the first value.

1 35. (Previously Added) The apparatus of claim 34, wherein: the first and the second logical
2 processors are the same logical processor, and wherein the non-speculative thread
3 and the speculative thread are to be time multiplexed for execution on the same
4 logical processor.

1 36. (Previously Added) The apparatus of claim 34, wherein: the storage area includes a store
2 buffer, and wherein the speculation ID field is included within a store buffer entry
3 of the store buffer, the store buffer entry to also hold a first address associated
4 with the store instruction and the data associated with the store instruction.

1 37. (Previously Added) The apparatus of claim 36, wherein: the first value is to include a
2 first identifier (ID) value associated with the first logical processor.

1 38. (Previously Added) The apparatus of claim 37, wherein: the control logic includes
2 comparison logic to compare a second address and a second ID value, which are
3 associated with a load instruction that is to be executed as part of the non-
4 speculative thread on the second logical processor, with the first address and the
5 first ID value; and
6 store blocker logic to prevent data associated with the store instruction from being
7 consumed by the load instruction that is to be executed as part of the non-
8 speculative thread, in response to the first ID value and the first address not
9 matching the second ID value and the second address.

1 39. (Previously Added) The apparatus of claim 34, wherein: the processor further includes a
2 third logical processor to execute an additional speculative thread, and wherein
3 the control logic is to allow data associated with the store instruction from being
4 consumed by the additional speculative thread.

1 40. (Previously Added) The apparatus of claim 34, wherein: the first value is to include a 1-
2 bit mode value.
3 comparison logic.

1 41. (Previously Added) The apparatus of claim 34, wherein: the processor further includes
2 marking logic to set the speculation ID field to the first value in response to
3 detecting the store instruction associated with the speculative thread.